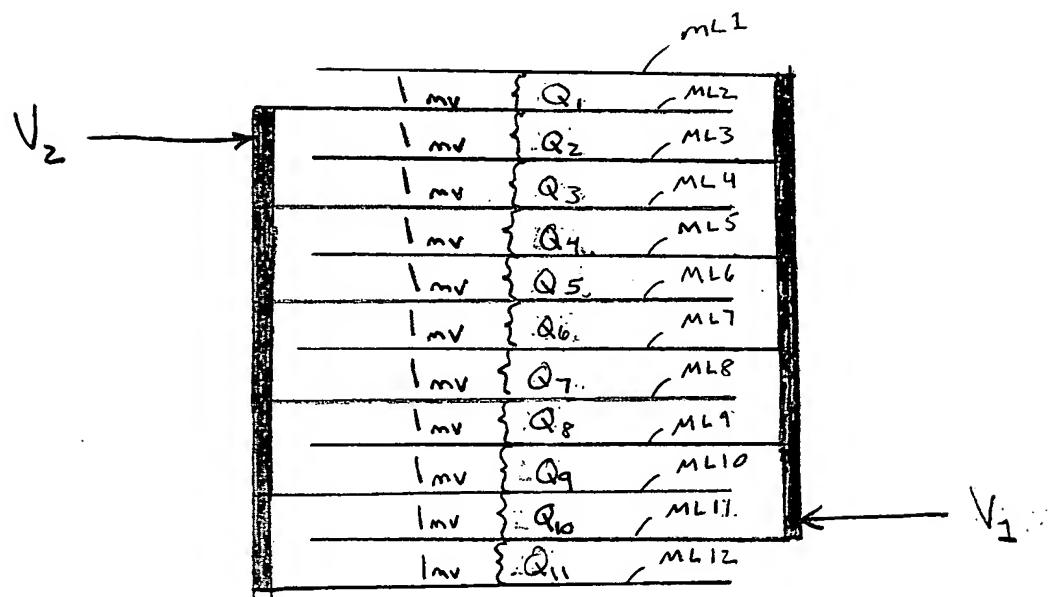


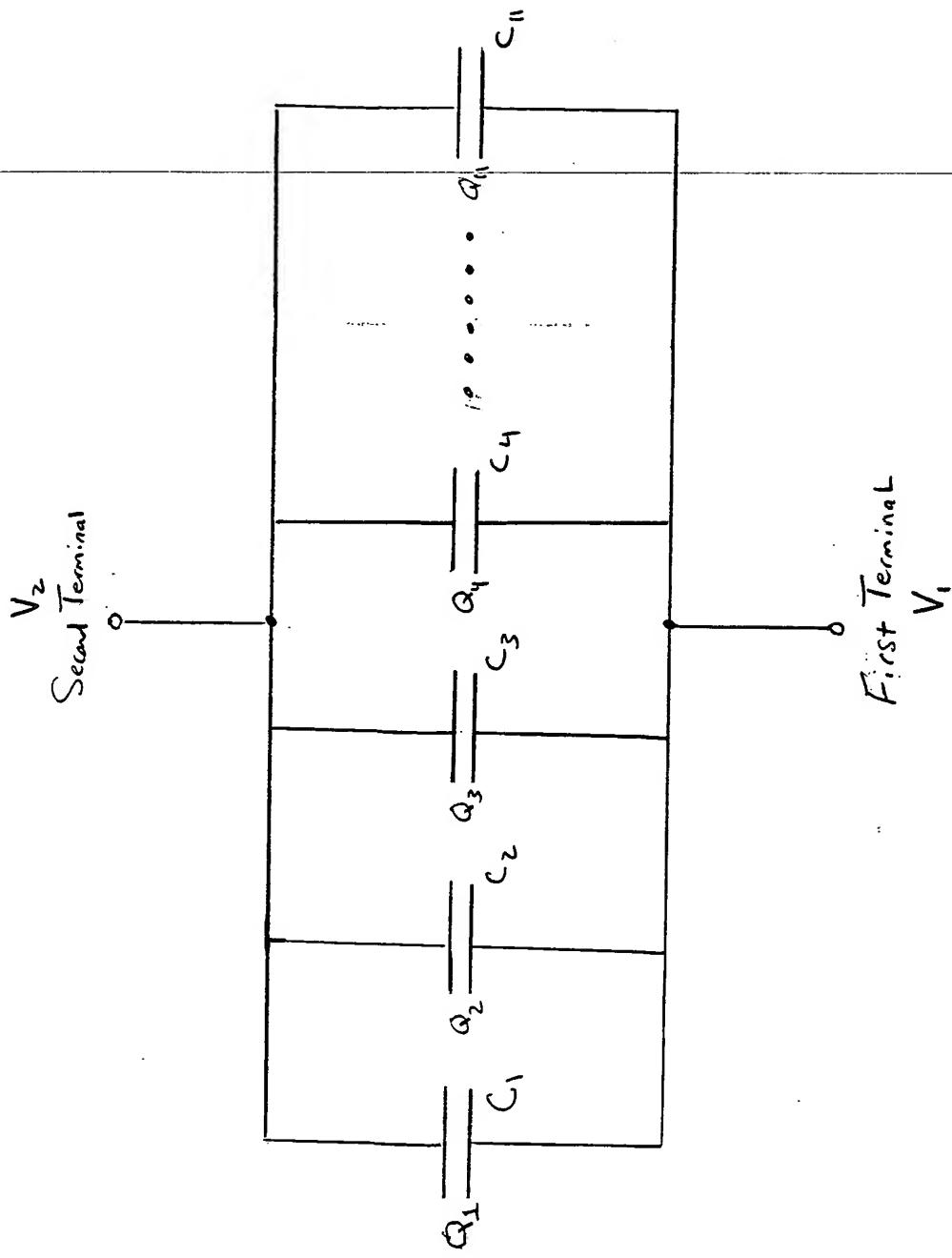
Fig. 1



$$Q_{\text{Total}} = Q_1 + Q_2 + Q_3 + Q_4 + Q_5 + Q_6 + Q_7 + Q_8 + Q_9 + Q_{10} + Q_{11}$$

Fig. 2

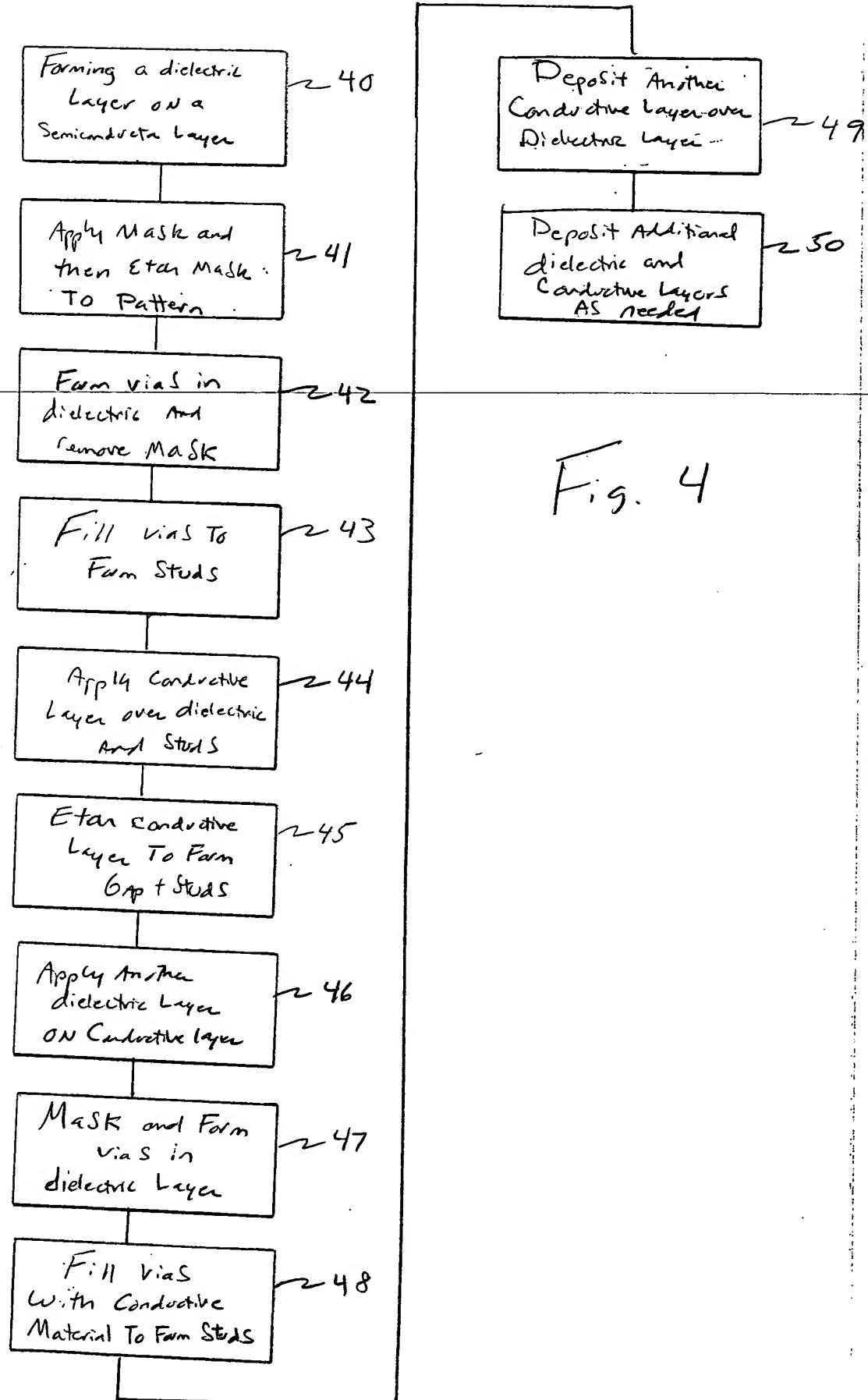
Fig. 3



$$Q = C V$$

$$C_{Total} = C_1 + C_2 + C_3 + \dots + C_n$$

$$\Delta V = V_2 - V_1$$



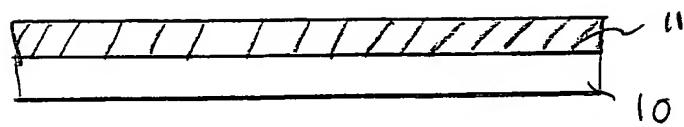


Fig. 5(a)

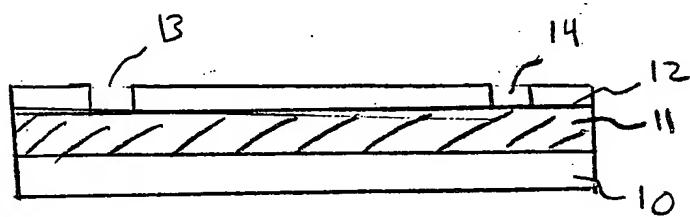


Fig. 5(b)

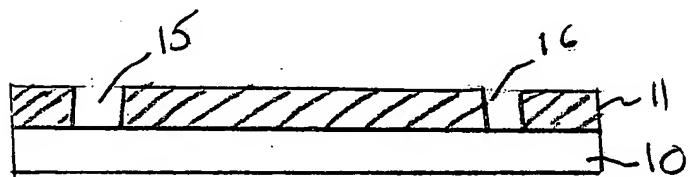


Fig. 5(c)

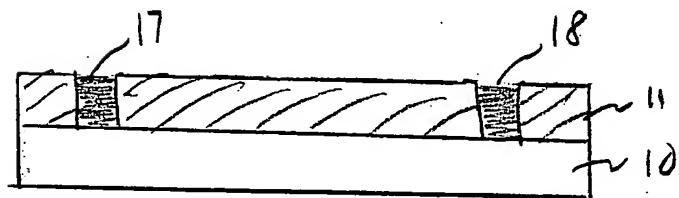


Fig. 5(d)

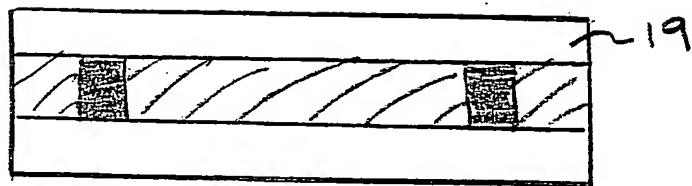


Fig. 5(e)

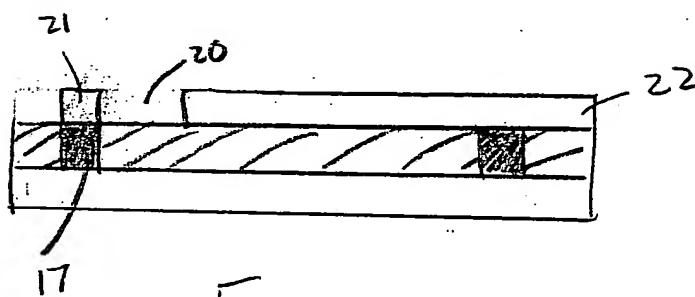


Fig. 5(f)

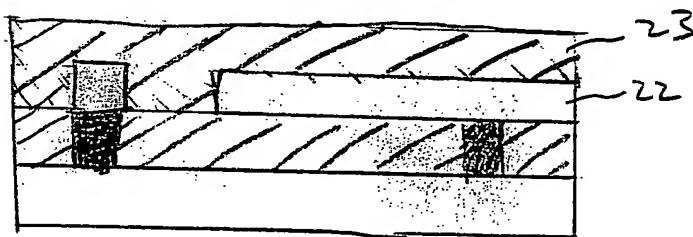


Fig. 5(g)

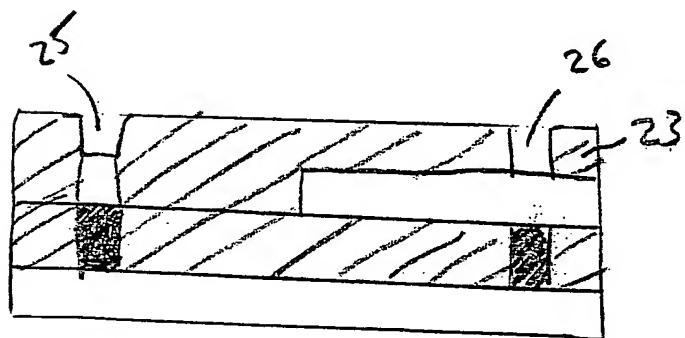


Fig. 5(h)

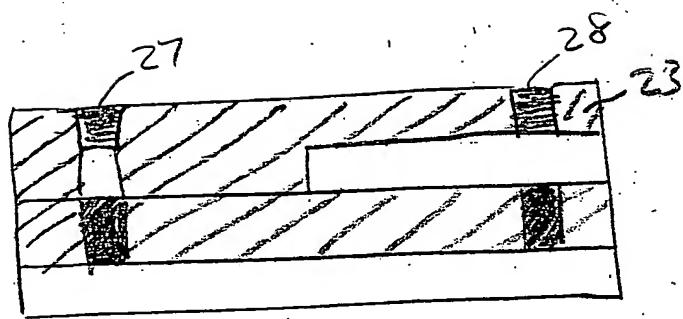


Fig. 5(i)

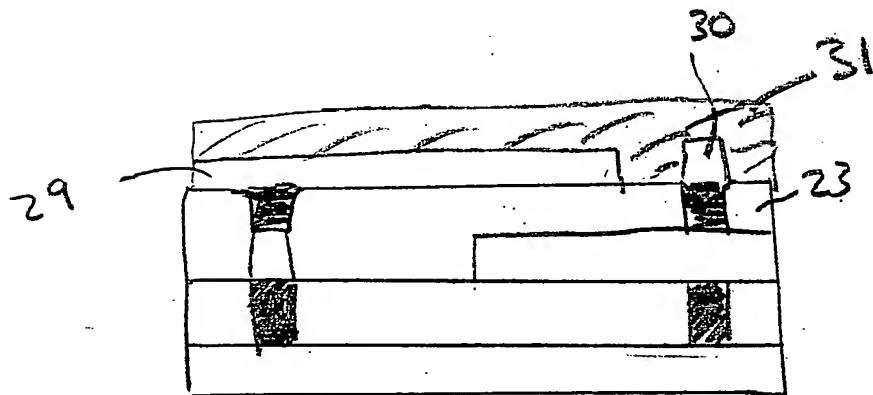


Fig. 5(j)

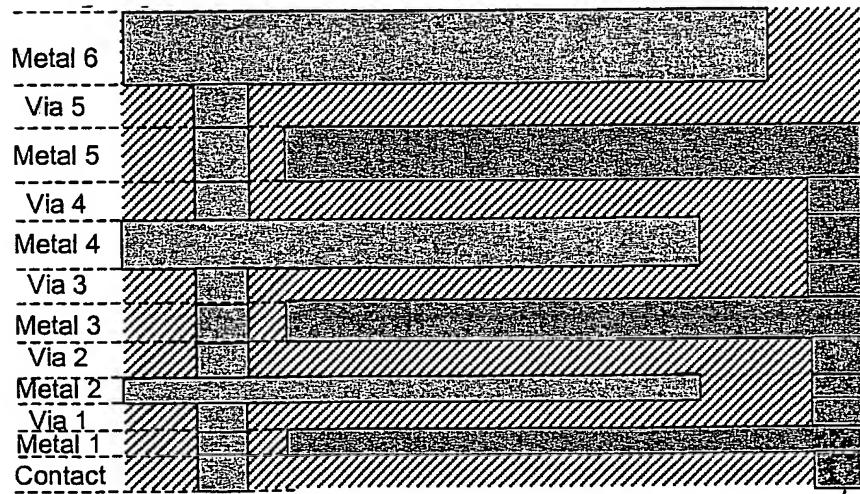


Fig. 5(k)

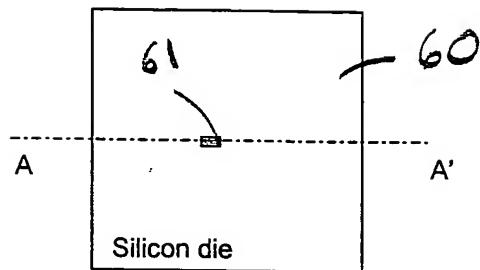


Fig.6(a)

**Equivalent capacitor**

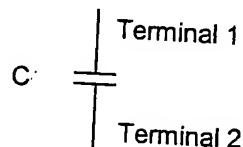


Fig.6(b)

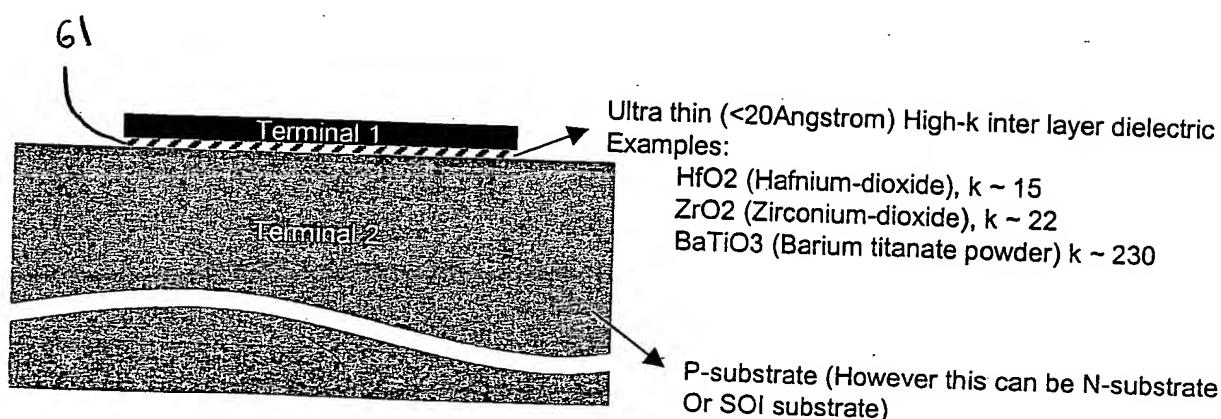


Fig.6(c)

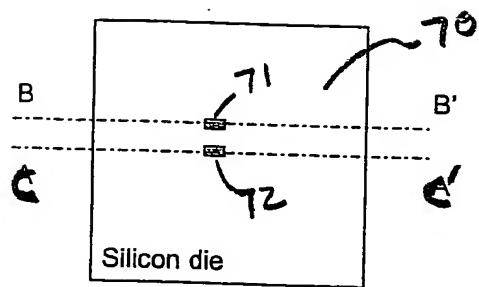


Fig. 7(a)

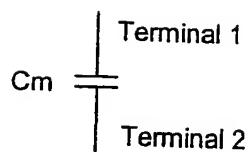


Fig. 7(b)

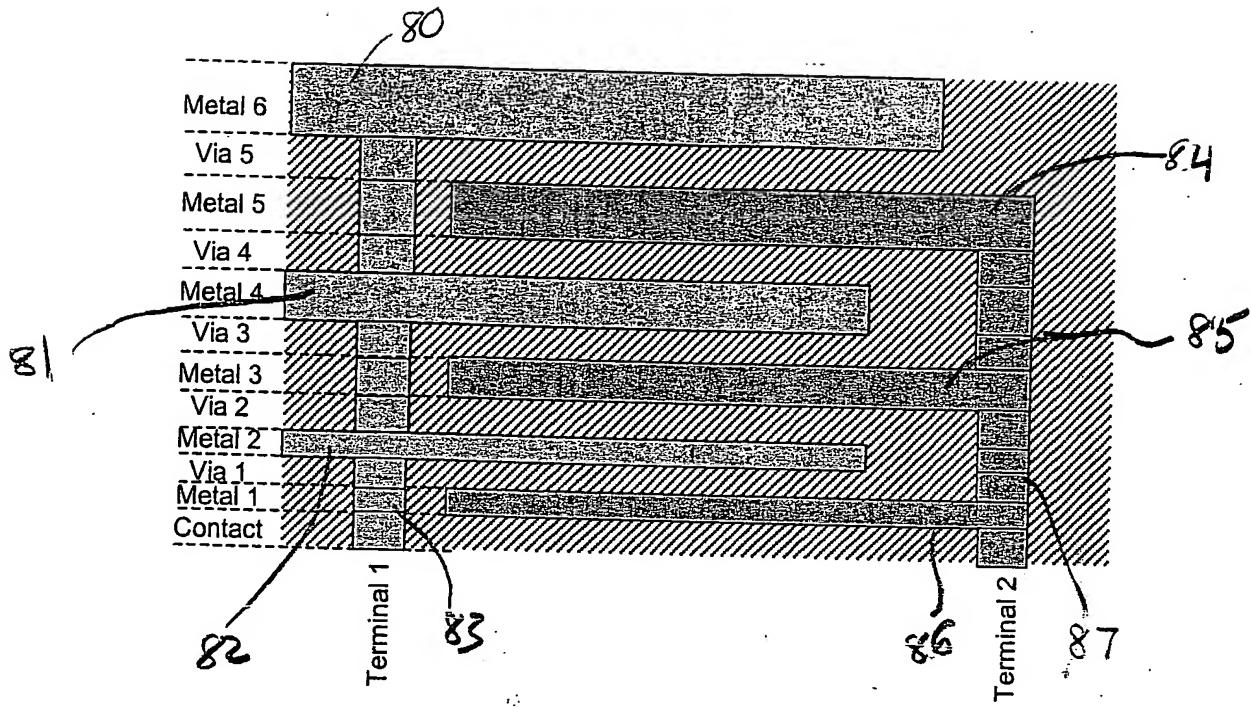


Fig. 8(a)

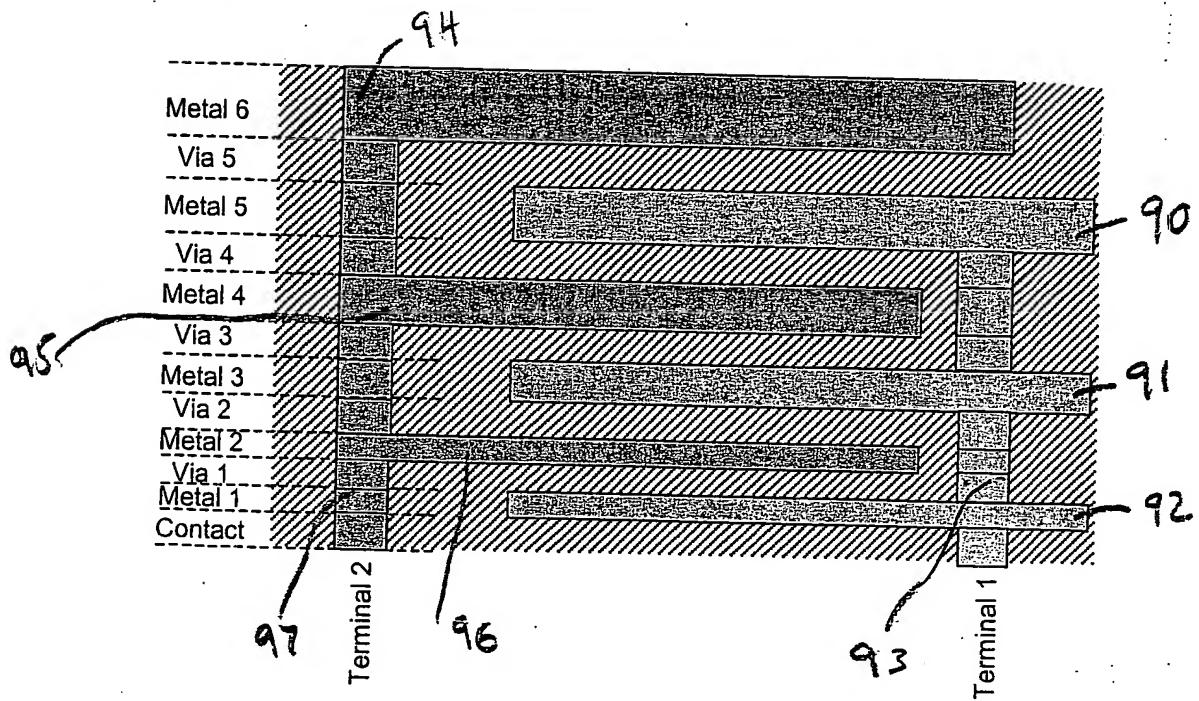


Fig. 8(b)

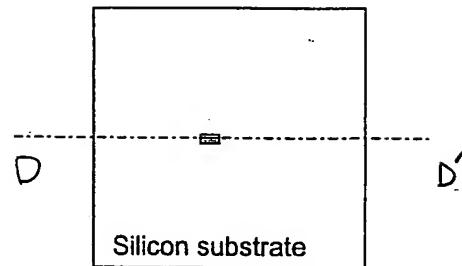


Fig. 9(a)

**Equivalent capacitor**

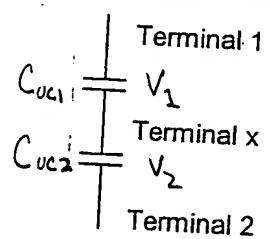


Fig. 9(b)

Terminal 1

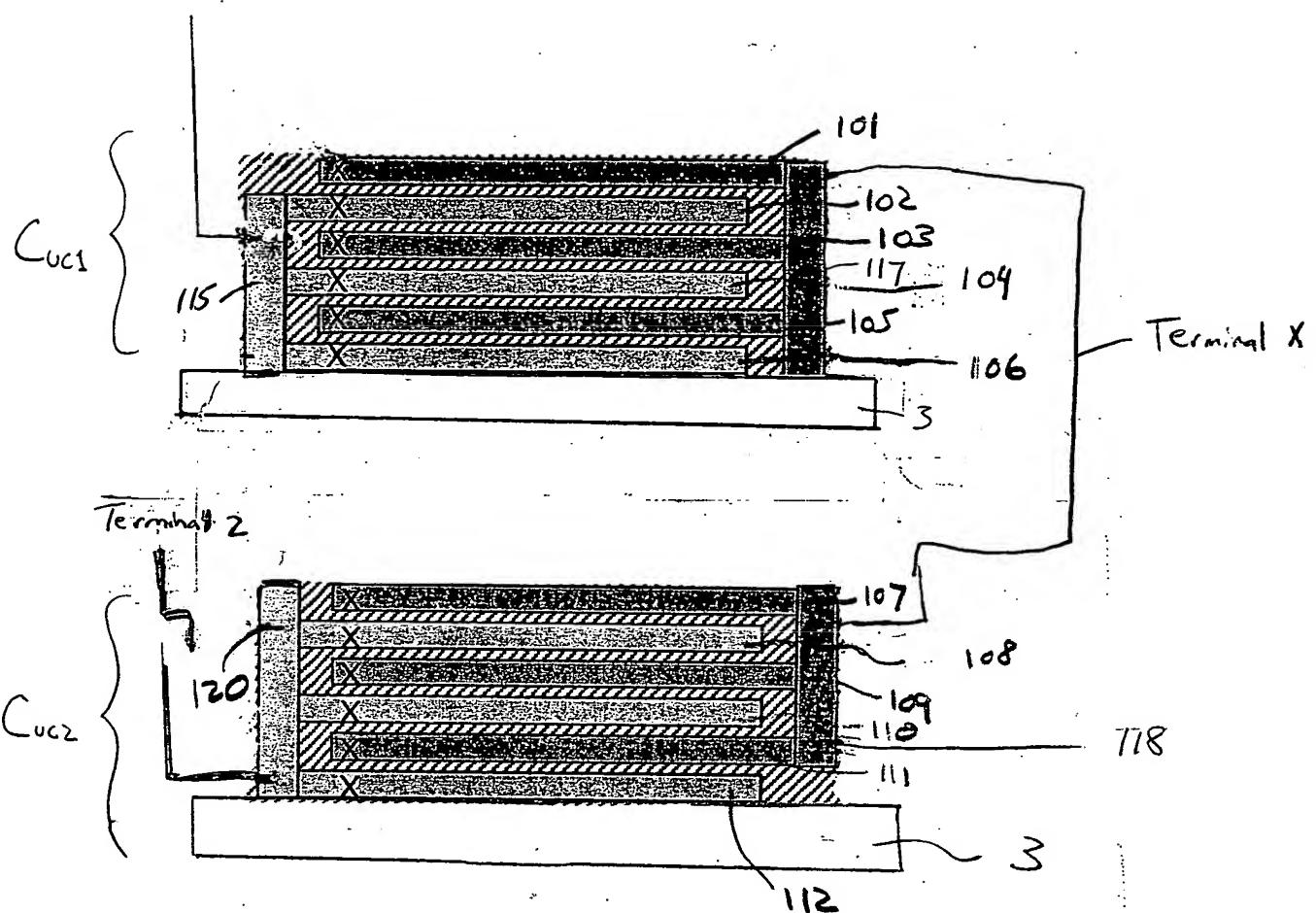
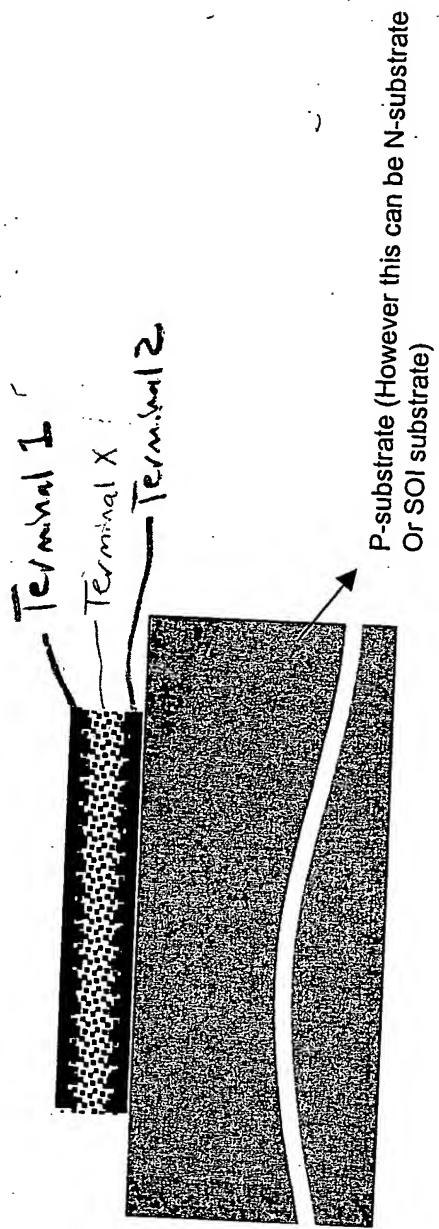


Fig. 10



**Electrode (Terminal 1)** – Example: Porous carbon or doped silicon. Can be conductive carbon or silicon nanotube.

**Electrolyte (Terminal x)** – Example: Potassium hydroxide

**Electrode (Terminal 2)** – Example: Porous carbon or doped silicon. Can be conductive carbon or silicon nanotube.

Fig. 11

Example cross section showing stacking of multiple substrate to increase the capacitance per unit area

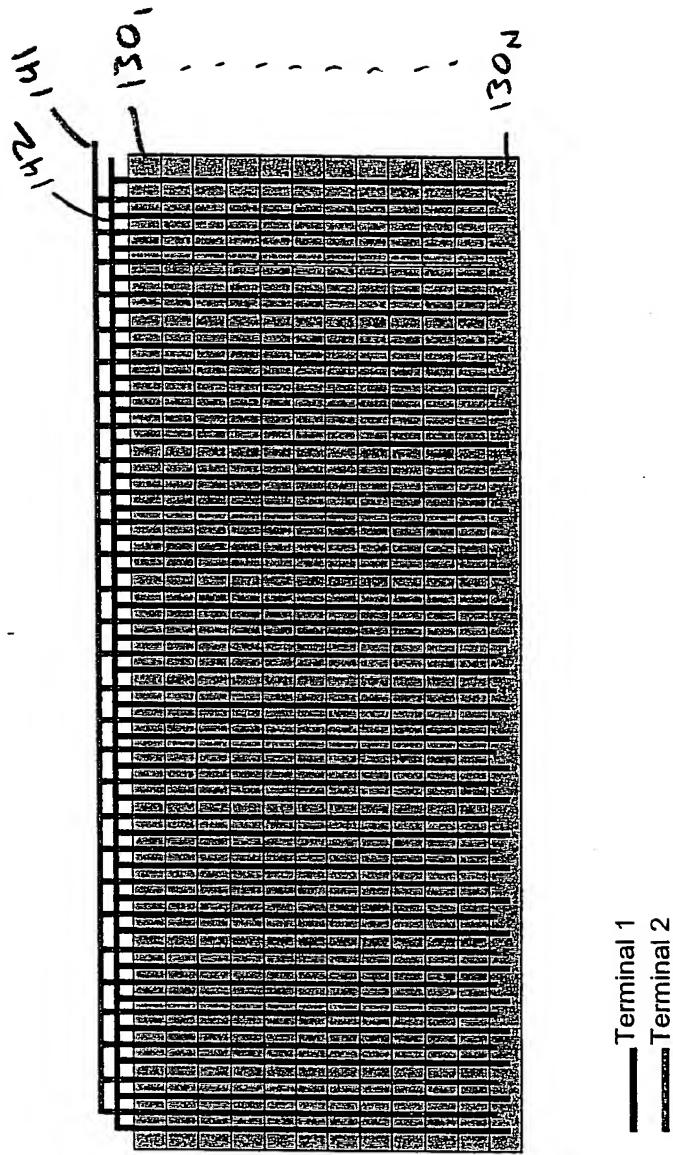


Fig. 12

## Energy Extraction Circuit (Integrated with the capacitor)

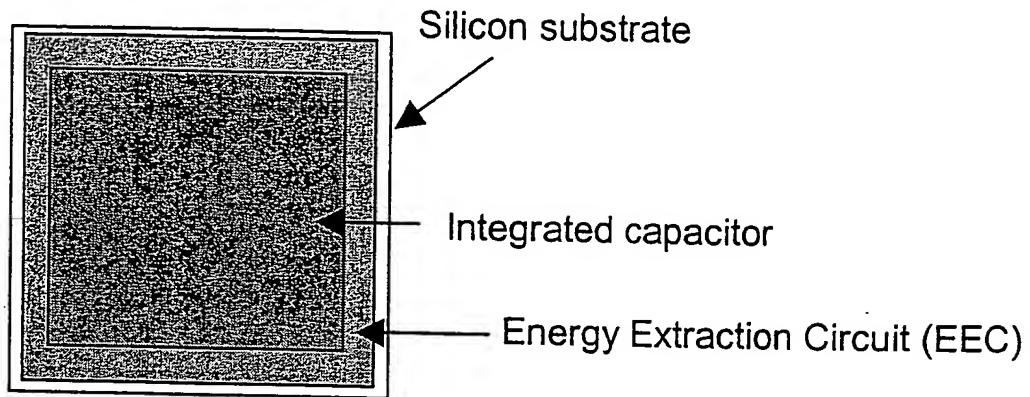


Fig. 13

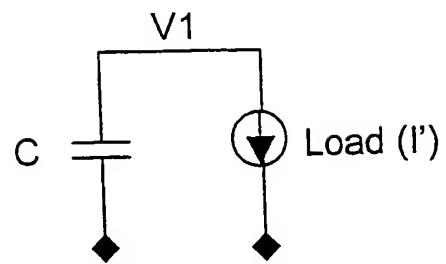


Fig. 14

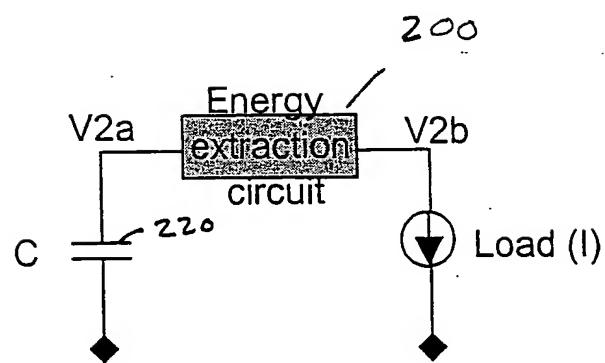
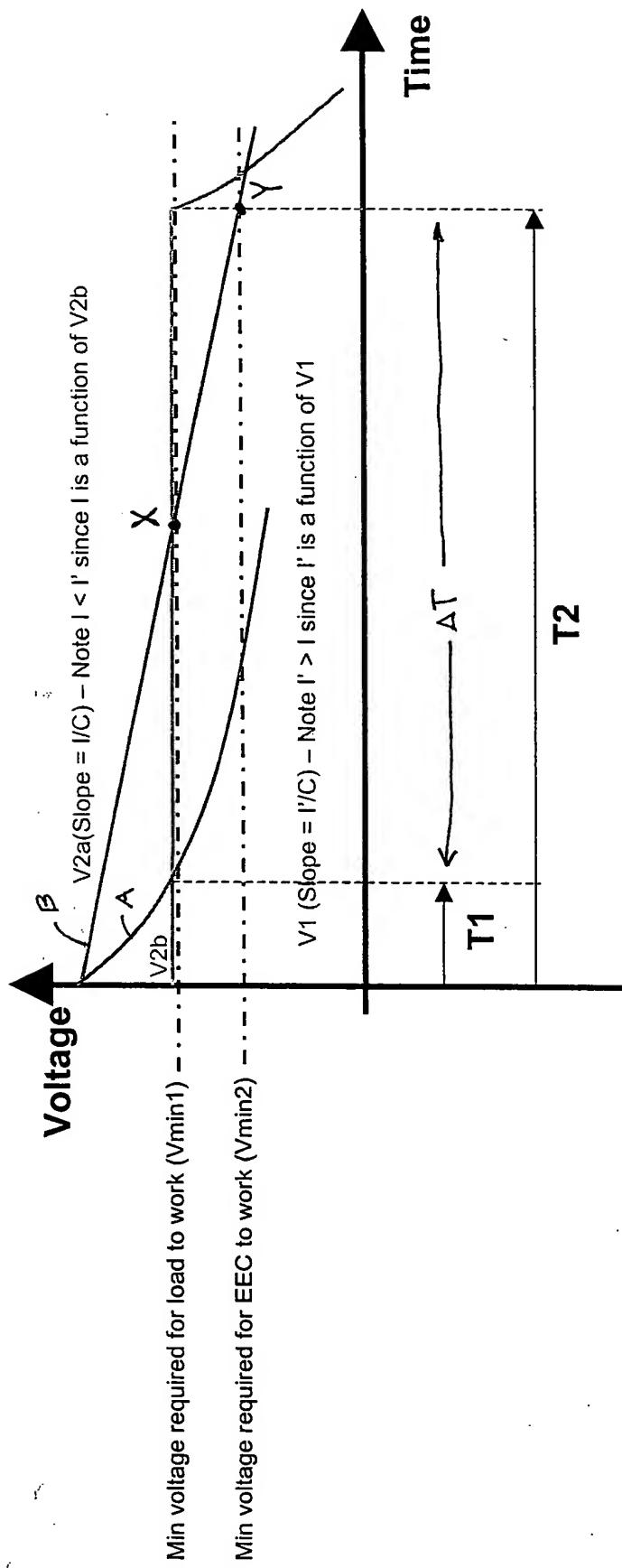


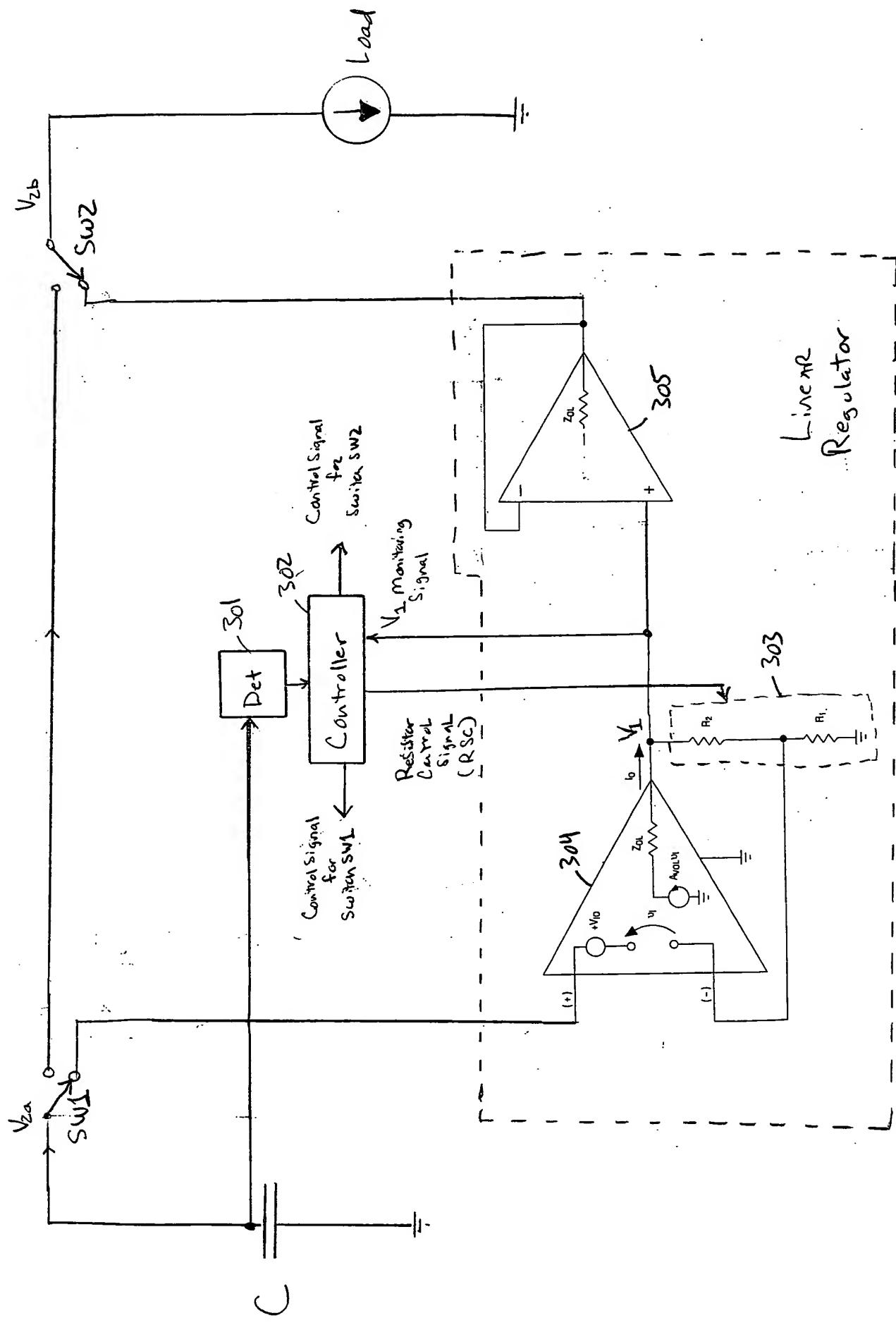
Fig. 16



$T_1$  – Duration for which the capacitor energy can be used by load without EEC  
 $T_2$  – Duration for which the capacitor energy can be used by the load with EEC

Fig. 15

Fig. 17



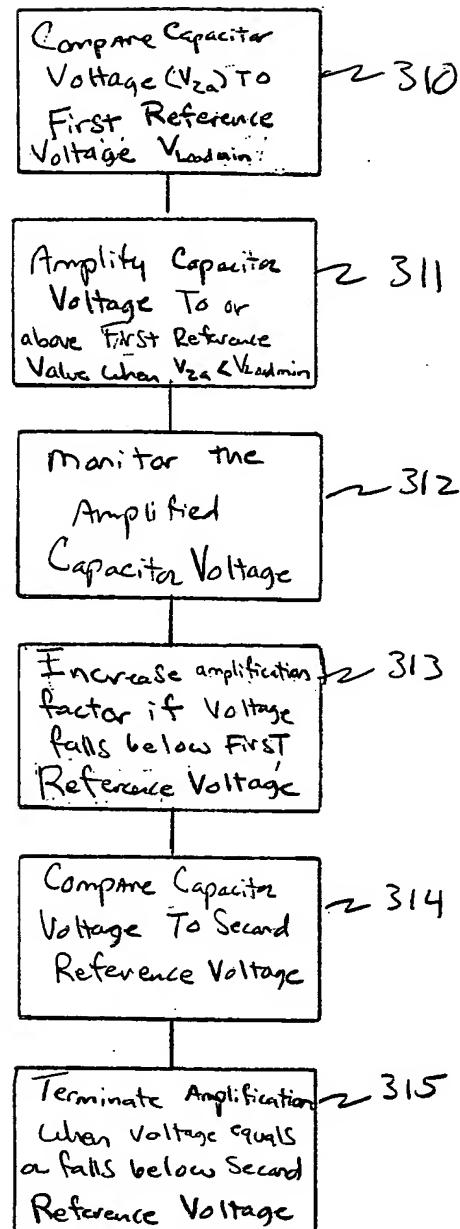
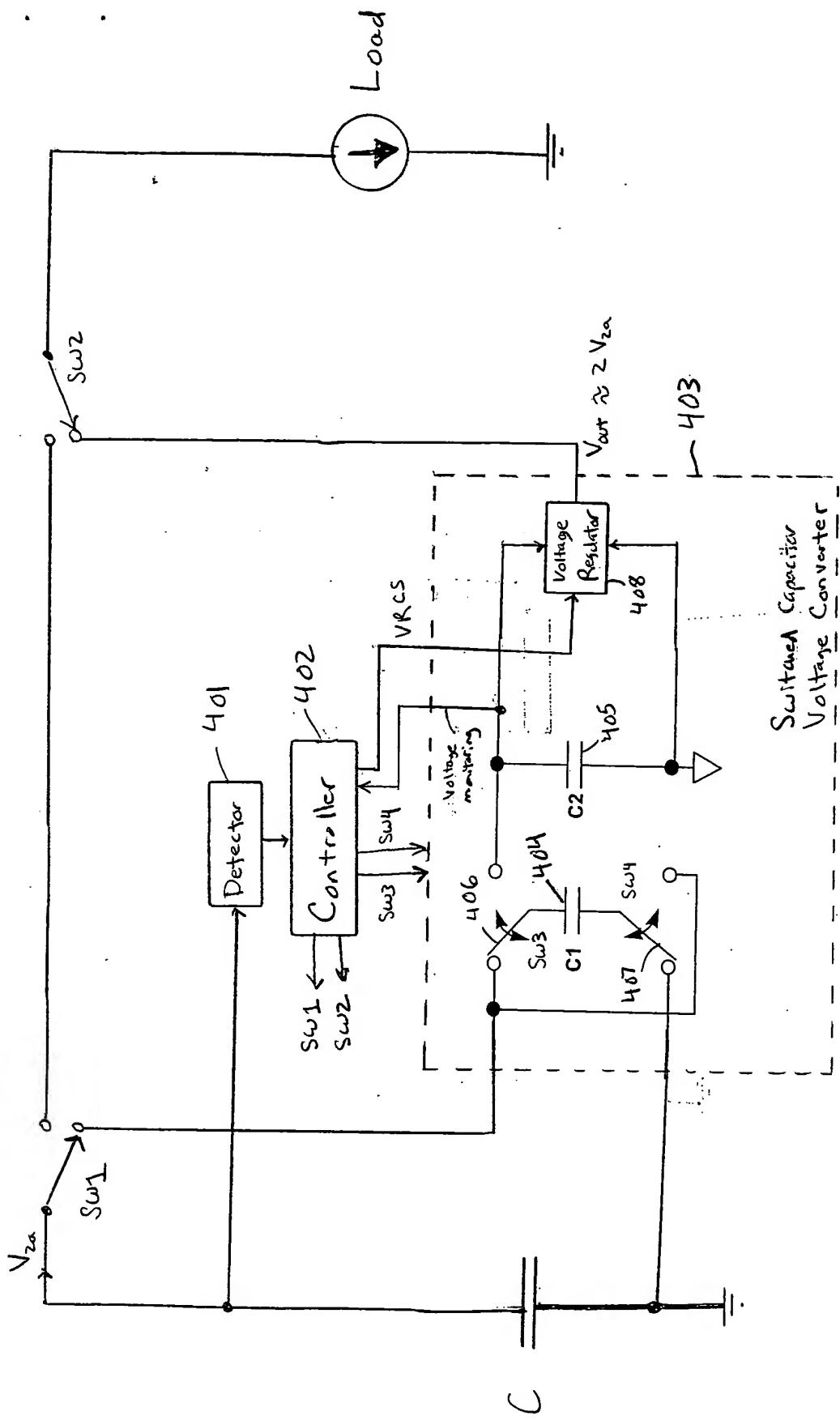


Fig. 18

Fig. 19



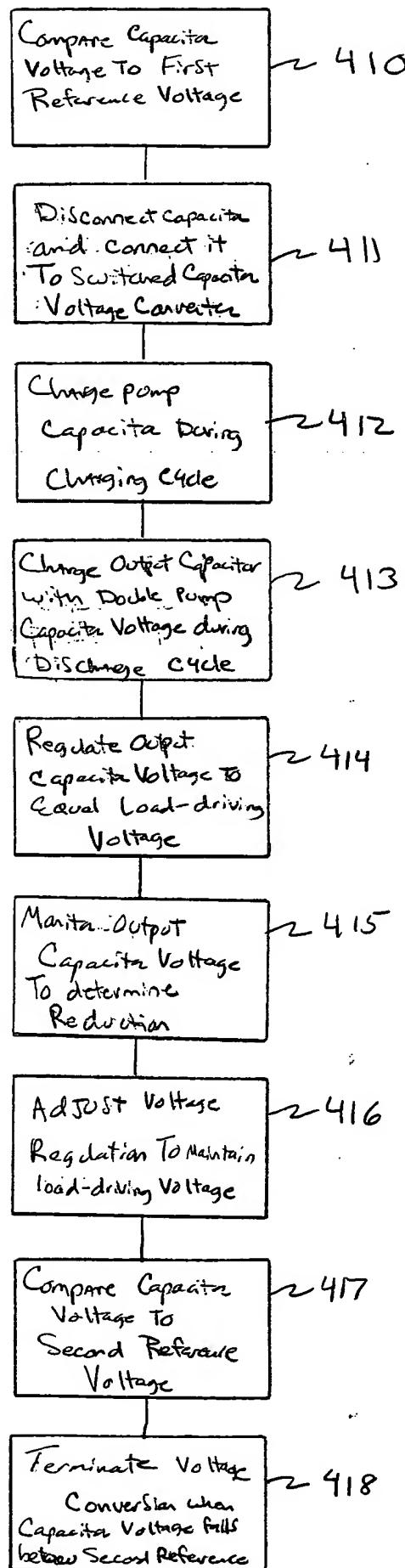
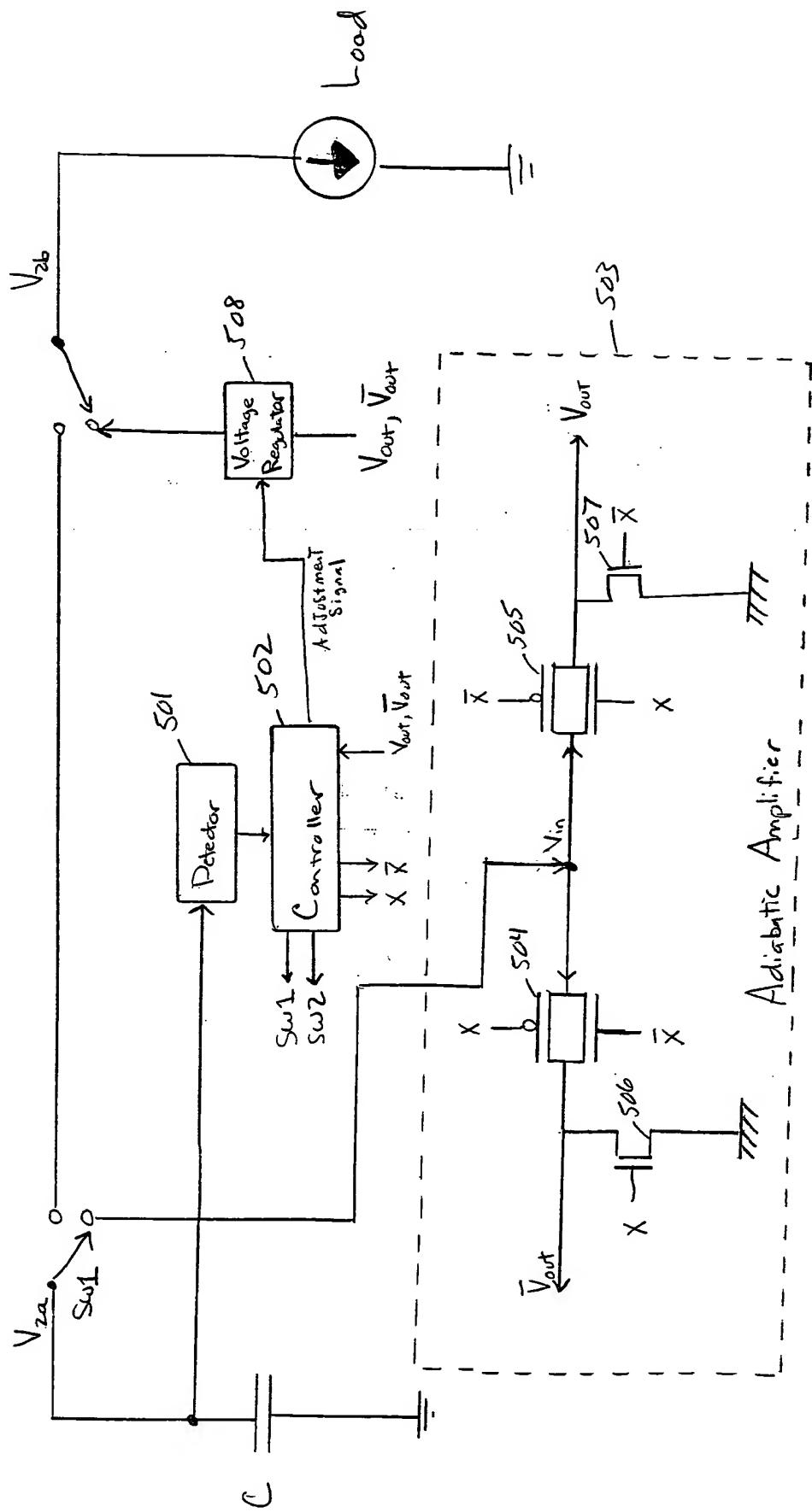


Fig. 20

Fig. 21



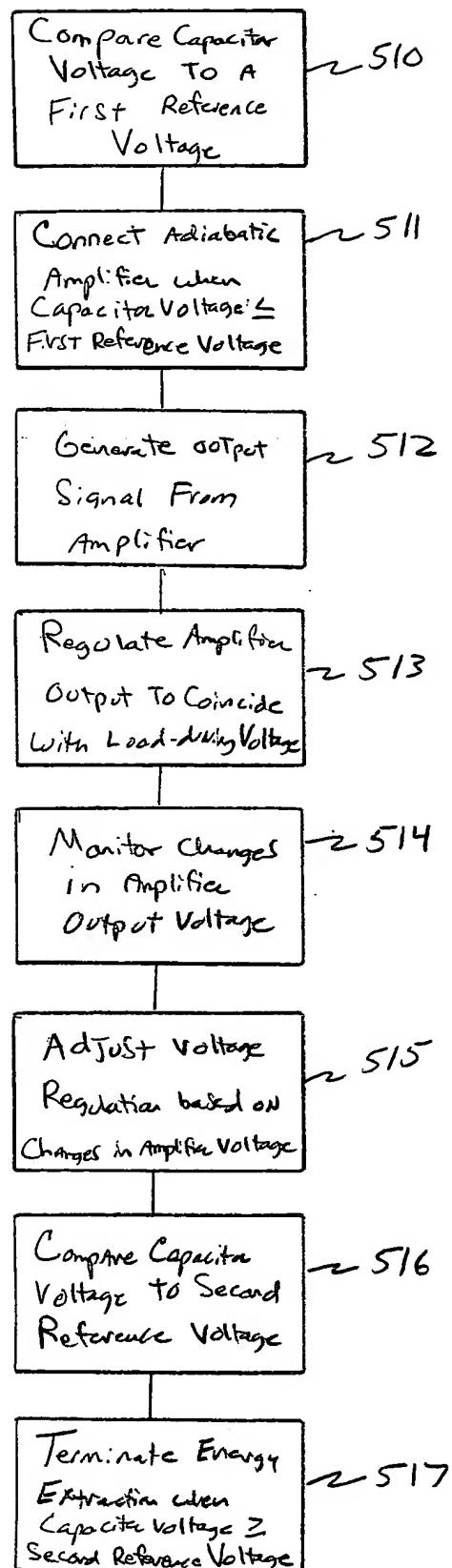
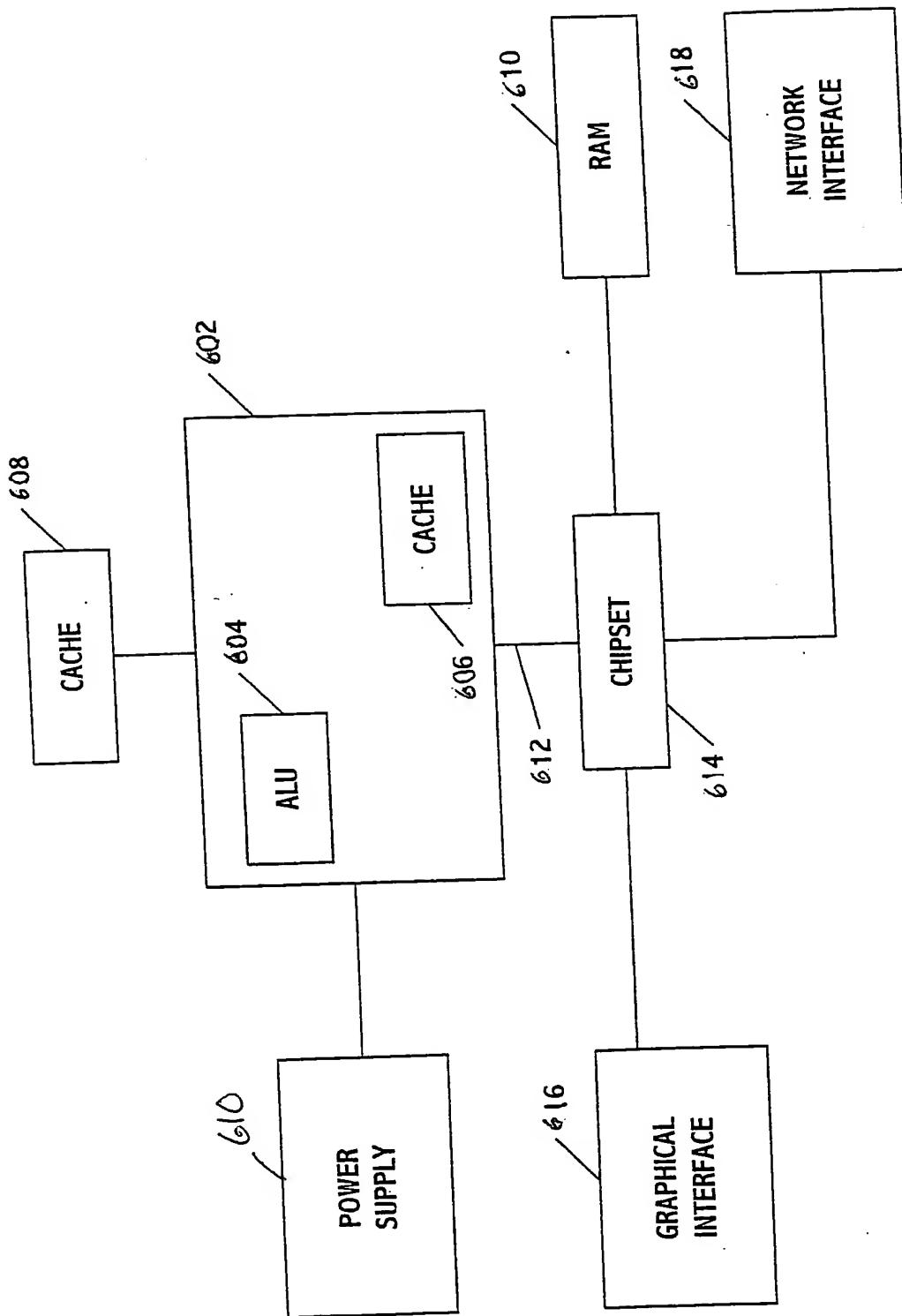


Fig. 22



**FIG. 2.3**